

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of

Carrier Current Systems, including Broadband over)
Power Line Systems)

Amendment of Part 15 regarding new requirements)
and measurement guidelines for Access Broadband)
over Power Line Systems)

ET Docket No. 04-37

Comments of Robert A. Schreibmaier

I. Introduction

1. The author, Robert A. Schreibmaier, is a retired electrical engineer and technical writer with 24 years of experience in the telecommunications industry, including 10 years of experience in the broadband industry.

II. Discussion

2. First, I would like to applaud the Commission for recognizing that current Part 15 requirements are inadequate for ensuring that Access BPL systems do not interfere with existing licensed services in the 1.7 to 80 MHz range.
3. A considerable amount of work has been done, and is continuing, to help quantify the effects of Access BPL signals to nearby receivers in the 1.7 to 80 MHz range.

However, it is premature to finalize any regulations regarding Access BPL deployment at this time, as sufficient information regarding the interference potential of Access BPL systems via ionospheric propagation is not yet available. It would be even better to restrict Access BPL to frequencies where interference to existing licensed services would not be an issue, such as 2 GHz or higher, where at least one

system has already been demonstrated (see <http://www.corridor.biz/0309-corridor-pr.pdf>). Plenty of bandwidth is available in this range for high-speed Internet services, certainly more than is available in the 1.7 to 80 MHz range, without the potential for interference to existing licensed services.

4. Phase 1 of the study, *Potential Interference From Broadband Over Power Line (BPL) Systems To Federal Government Radiocommunications At 1.7 – 80 MHz*, by the National Telecommunications and Information Administration (NTIA) indicates that application of existing Part 15 compliance measurement procedures for BPL systems results in “a significant underestimation of peak field strength.”
5. Using *Numerical Electromagnetic Code* (NEC), NTIA evaluated interference risks in terms of the geographic extent of locations where interference may occur to radio reception at four frequencies used by outdoor, overhead BPL systems claiming to conform to existing Part 15 rules. They found interference to land vehicle, boat, and fixed stations receiving low-to-moderate desired signal levels at receivers within areas extending to 75 meters, 100 meters, and 460 meters (some 1500 feet) from the power lines. Clearly, current Part 15 requirements are insufficient to prevent interference to existing licensed services in the 1.7 to 80 MHz range.
6. NTIA recommends several Access BPL compliance measurement requirements be added: “use measurement antenna heights near the height of power lines; measure at a uniform distance of ten (10) meters from the BPL device and power lines; and measure using a calibrated rod antenna or a loop antenna in connection with appropriate factors relating to magnetic and electric field strength levels at frequencies below 30 MHz.”

7. If Access BPL providers insist on using the 1.7 to 80 MHz range, instead of more appropriate frequencies, I support these recommendations from Phase 1 of the NTIA study as a good starting point. However, these recommendations have not yet considered the effects of ionospheric propagation of Access BPL signals. Sufficient data concerning ionospheric propagation of Access BPL signals will not be available at least until Phase 2 of the NTIA study is completed. It would be premature to finalize any regulations regarding Access BPL deployment before this information becomes available.
8. Now, I would like to address comments to some specific paragraphs of the NPRM. In paragraph 26 of the NPRM, it is noted that Ambient believes that its equipment using Orthogonal Frequency Division Multiplexing (OFDM) can be programmed to avoid transmitting on the sub-band or “notch” it out if a sub-band is being used by a nearby transceiver. In fact, it could only tell if the sub-band is being used if the transceiver actually transmits. If interference is being received on that sub-band, the transceiver is unlikely to transmit, as any response would probably not be received, due to the interference from the Access BPL system. Further, the OFDM equipment has no way to tell if receive-only equipment is using the sub-band. Therefore, it is very unlikely that the Access BPL equipment could automatically provide adaptive interference mitigation.
9. In paragraph 31 of the NPRM, the Commission proposes to “require that Access BPL devices employ adaptive interference mitigation techniques” without providing details. Since it has already been established that the access BPL equipment has no way to automatically provide adaptive interference mitigation, manual intervention is

required. Because of the constantly changing propagation characteristics of the high-frequency (HF) range, a response time measured in hours is insufficient. The frequency band in question may no longer be “open” to the desired geographical area. The response time should be in minutes. I propose that the Access BPL provider be required to have customer service representatives available at all times, 24 hours a day, 365 days a year to field interference complaints. Further, when an interference complaint is received, the interference must be eliminated within minutes.

10. A related issue is what penalties should be applied to the Access BPL provider when interference is not eliminated. Recently, it has been noted that one Access BPL provider feels that they are in “full compliance” with FCC Part 15 rules, even though their overhead BPL system in North Carolina continues to create harmful interference from 14.29 to nearly 17 MHz and from 21.0 to 21.1 MHz, and there is no interference mitigation at all in their underground facilities (see <http://www.arrl.org/news/stories/2004/04/22/2>). Further, the system continues to have carriers in the 17- and 12-meter amateur bands, despite efforts to notch those carriers.
11. To prevent the penalties for non-compliance from becoming just another “cost of doing business,” the penalties must be substantial, more than just a “slap on the wrist.” Further, the fines should be on both per day and per offense bases, so that continued non-compliance would be discouraged. This should provide a sufficient deterrent to non-compliance without creating a burden on those Access BPL providers who actually are providing effective interference mitigation.

12. Finally, I would like to correct a misconception that is indicated in paragraph 35 of the NPRM, where the Commission states, "... we note that ARRL acknowledges that noise from power lines, absent any Access BPL signals, already presents a significant problem for amateur communications. We therefore would expect that, in practice, many amateurs already orient their antennas to minimize reception of emissions from nearby electric power lines." In fact, this rarely occurs. Many stations do not have directional antennas. Further, directional antennas, where available, are aimed in such a way as to maximize the received signal from the station with which one is attempting to communicate. Note that this also tends to maximize the transmitted signal to that station. Aiming the antenna to minimize interference will likely not maximize the received and transmitted signals, greatly reducing the signals at both ends of the communications circuit, and greatly reducing the probability of successful communication. That is why it is rarely done.

Respectfully submitted,

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